REMARKS

Entry of the foregoing, and further and favorable reconsideration of the subject application are respectfully requested.

By the present Amendment, new claims 38 and 39 have been added. The claims derive support from throughout the specification and claims as originally filed. No new matter has been added.

In the Official Action, claims 1-21 and 23-37 are rejected under 35 U.S.C. § 103 as purportedly obvious over Nakayama et al. (Langmuir 1999, 15, 5560-6666) in view of Wang et al. (J. Chem. Tech. Biotechnol. 1997, 70, 355-362) and Arnold et al. (US-648) and Arnold et al. (US-428) and Arnold et al. (US-637) and Mosbach et al. (US-154). This rejection is respectfully traversed.

The requirements of a *prima facie* case of obviousness are set forth in MPEP 2143:

> To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the references or combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references) when combined must teach or suggest all the claimed limitations.

The publications cited in the Official Action neither disclose nor suggest the step "reuse of the polymerization medium for preparing further supported molecularly imprinted polymer by repeating steps (a)-(d)" as required by the only independent claims, claims 1 and 12. Consequently, the presently claimed invention is not prima facie obvious over the cited publications.

In addition, Nakayama et al. relates to surface modification by sequentially forming polymer blocks on a polystyrene surface for biomedical applications, such as heparin immobilization, protein immobilization, and drug-release. In contrast to molecular imprinting, which is the subject of the presently claimed invention (see step (b) of independent claims 1 and 12) and where the objective is to achieve molecular recognition for a given target compound, Nakayama et al. describes methods to achieve slow release of a particular compound. According to the method of Nakayama et al., polymerization is conducted first before adding the bio-active substance (heparin, protein, or drug). The latter is then retained in the layer due to subsequent polymerization of a blocking polymer layer. Since the step is carried out in the absence of cross-linking it is highly unlikely that the polymer resulting from the method of Nakayama et al. will retain templated bonding sites for the bio-active substance. In fact, no mention is made of any reabsorption or rebinding step that would lead to the occupation of such sites. This stands in contrast with the presently claimed invention where the template molecule is first associated with a functional monomer, and thereafter the template-functional monomer-assembly is polymerized in the presence of a cross-linking monomer to provide a molecularly imprinted polymer. By definition, this polymer is capable of rebinding the template or similar molecules with high affinity and selectivity. Again, reuse of the polymerization medium for the preparation of further batches of molecularly imprinted polymer is neither disclosed nor suggested by Nakayama et al.

Wang et al. relates to the molecular imprinting of N,N′-diethyl-amino-dithiocarbamoyl-methylstyrene (DTCS)-modified polyacrylonitrile membranes using theophylline as the template molecule in the polymerization of acrylate acid N,N′-methylenebisacrylicamide on the surface of the polyacrylonitrile membrane. The presently claimed invention is significantly different from Wang et al. Independent claims 1 and 12 define the separation of the supported molecular imprinted polymer from the polymerization medium and the reuse of the separated polymerization medium for the preparation of further supported molecularly imprinted polymer. This reuse feature dramatically improves the yield of the molecularly imprinted polymer and lowers the consumption of template and functional monomer. It also makes it possible to prepare the molecularly imprinted polymer in a continuous process. Such reuse is neither disclosed nor suggested by Wang et al. The benefits of this process are outlined on page 6, lines 1-24 of the present specification.

The presently claimed invention also includes new and inventive aspects compared to Wang et al., such as the two point attachment of the initiator according to claims 6 and 16; the new two point attachment azo-initiator according to claims 17 and 23; the confinement to the support of an initiator that is insoluble in the polymerization medium; the use of the microwave irradiation to initiate polymerization and the grafting of multiple layers using living polymerization techniques. None of these aspects are disclosed or suggested by Wang et al.

It is also unlikely that Nakayama et al. and Wang et al. combined would lead a person skilled in the art to arrive at the presently claimed invention. First, the Official Action does not point to any portion of either publication showing motivation to combine them. In addition, Nakayama reports applications within the fields of biomaterials and tissue engineering mainly for *in vivo* applications whereas Wang et al. focuses on membrane based separations. Thus the presently claimed invention is patentable over both Nakayama et al. and Wang et al.

The three Arnold patents and the Mosbach patent cited in the Official Action describe the grafting of molecularly imprinted polymers on the surface of silica supports using the more common "grafting to" approach. A detailed comparison of the two grafting techniques: "grafting to" and "grafting from" is found on page 5 and 6 on page 9 from line 19 of the present specification. In particular the difficulty in reusing the reaction medium and controlling the layer thickness (see page 5, lines 27-28) using the "grafting to" approach has limited a widespread use of the grafting approach to prepare molecularly imprinted materials. However, with the "grafting from" approach, by generating the initiating radicals at or near the surface, this is possible and the benefits of the "grafting from" approach (page 5 through 6) can thus be fully exploited. The invention is thus based on generation of initiating radicals at or near the surface which can be achieved by immobilizing the conventional azo-initiators or by selectively generating heat at the surface using microwave radiation.

It is therefore improper to compare the immobilizing initiators used in the presently claimed invention with soluble initiators described in the cited publications. The fundamental differences between the "grafting to" approach described in the patents by Arnold and Mosbach and the "grafting from" approach of the presently claimed invention renders the present claims patentable over the cited publications.

For the above reasons, a withdrawal of this rejection is thus respectfully requested.

From the foregoing, further and favorable reconsideration in the form of a Notice of Allowance is believed to be next in order and such action is earnestly solicited.

In the event there are any questions concerning this Amendment or the application in general, the Examiner is respectfully urged to telephone the undersigned so that prosecution of this application may be expedited.

Respectfully submitted,

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